CLAIMS:

1. An implantable medical device comprising:

an electrode;

at least two pacing output channels, each pacing output channel including a capacitor that stores energy for delivery as a pacing pulse to a heart of a patient via the electrode; and

a control circuit to control delivery of the pacing pulse by selectively coupling the capacitors to the electrode.

2. An implantable medical device according to claim 1, wherein each of the pacing output channels includes switches, and the control circuit controls delivery of pacing pulses by each of the pacing output channels by controlling the configuration of the switches of each of the pacing output channels to charge and discharge the capacitor of each of the pacing output channels.

3. An implantable medical device according to claim 1, further comprising charge pumps to charge the capacitors, wherein the control circuit controls each of the charge pumps to charge an associated one of the capacitors to a selected voltage.

4. An implantable medical device according to claim 3, wherein the control circuit controls a first one of the charge pumps to charge a first one of the capacitors to a first voltage, controls a second one of the charge pumps to charge a second one of the capacitors to a second voltage, monitors electrical activity within the heart via the electrode, and selectively couples at least one of the first and second capacitors to the electrode based on the electrical activity.

5. An implantable medical device according to claim 4, wherein the control circuit detects an intrinsic depolarization of the heart, and couples the second one of the capacitors to the electrode following expiration of an extra-systolic interval after the detection to deliver an extra-systolic pulse to the heart.

6. An implantable medical device according to claim 4, wherein the control circuit couples the first one of the capacitors to the electrode to deliver a pacing pulse to the heart upon expiration of an escape interval, and couples the second one of the capacitors to the electrode following expiration of an extra-systolic interval after delivery of the pacing pulse to deliver an extra-systolic pulse to the heart.

7. An implantable medical device according to claim 4, wherein the second voltage is less than the first voltage.

8. An implantable medical device according to claim 1, wherein the electrode is a first electrode, the device further comprising a second electrode, and

wherein the control circuit couples a first one of the capacitors to the first electrode and a second one of the capacitors to the second electrode for delivery of cardiac resynchronization therapy pulses via the first and second electrodes, and couples the second one of the capacitors to the first electrode for delivery of extra-systolic pulses.

9. An implantable medical device according to claim 1, wherein the electrode is a first electrode, the device further comprising a second electrode, and

wherein the control circuit couples a first one of the capacitors to the first electrode and a second one of the capacitors to the second electrode for delivery of cardiac resynchronization therapy pulses via the first and second electrodes, and couples a third one of the capacitors to at least one of the first and second electrodes for delivery of extra-systolic pulses.

10. An implantable medical device according to claim 10, wherein the electrode is a first electrode, the device further comprising a second electrode, and

wherein the control circuit couples a first one of the capacitors to the first electrode and a second one of the capacitors to the second electrode for delivery of cardiac resynchronization therapy pulses via the first and second electrodes, and couples a third one of the capacitors to the first electrode for delivery of extra-systolic pulses, and couples a fourth one of the capacitors to the second electrode for delivery of extra-systolic pulses.

11. An implantable medical device according to claim 11, wherein the control circuit couples the third one of the capacitors to the first electrode at a first time for delivery of an extra-systolic pulse with a first amplitude, and couples the fourth one of the capacitors to the second electrode at a second time for delivery of an extra-systolic pulse with a second amplitude.

12. An implantable medical device according to claim 1, wherein the electrode is one electrode of an electrode pair and wherein said electrode is adapted to couple to the heart in one of the following locations: an endocardial location, an epicardial location, a transvenous location, a subcutaneous location, a pericardial location, a location within a cardiac vein, a location within a coronary sinus.

13. A method comprising:

coupling a first capacitor that stores energy to an electrode at a first time for delivery of a first pacing pulse to a heart; and coupling a second capacitor that stores energy to the electrode at a second time for delivery of a second pacing pulse to the heart.

14. A method according to claim 13, further comprising detecting an intrinsic depolarization of the heart via the electrode, wherein coupling the second capacitor comprises coupling the second capacitor to the heart following expiration of an extra-systolic interval after the detection to deliver an extra-systolic pulse to the heart.

15. A method according to claim 13, wherein coupling the first capacitor comprises coupling the first capacitor to the heart upon expiration of an escape interval to deliver a pacing pulse to the heart, and coupling the second capacitor comprises coupling the second capacitor to the heart following expiration of an extra-systolic interval after delivery of the pacing pulse to deliver an extra-systolic pulse to the heart.

16. A method according to claim 15, wherein an amplitude of the extra-systolic pulse is less than an amplitude of the pacing pulse.

17. A method according to claim 13, wherein the electrode is a first electrode, the method further comprising coupling the second capacitor to a second electrode for delivery of a first cardiac resynchronization therapy pacing pulse, and

wherein coupling the first capacitor to the first electrode comprises coupling the first capacitor to the first electrode for delivery of a second cardiac resynchronization therapy pacing pulse, and coupling the second capacitor to the first electrode comprises coupling the second capacitor to the first electrode for delivery of an extra-systolic pulse.

19. A method according to claim 13, wherein the electrode is a first electrode, the method further comprising coupling a third capacitor to a second electrode for delivery of a first cardiac resynchronization therapy pacing pulse, and

wherein coupling the first capacitor to the first electrode comprises coupling the first capacitor to the first electrode for delivery of a second cardiac resynchronization therapy pacing pulse, and coupling the second capacitor to the first electrode comprises coupling the second capacitor to at least one of the first and second electrodes for delivery of an extra-systolic pulse.

20. A method according to claim 13, wherein the electrode is a first electrode, the method further comprising coupling a third capacitor to a second electrode for delivery of a first cardiac resynchronization therapy pacing pulse, and

wherein coupling the first capacitor to the first electrode comprises coupling the first capacitor to the first electrode for delivery of a second cardiac resynchronization therapy pacing pulse, and coupling the second capacitor to the first electrode comprises coupling the second capacitor the first electrode for delivery of a first extra-systolic pulse, and

the method further comprising coupling a fourth capacitor to the second electrode for delivery of a second extra-systolic pulse.

21. A method according to claim 20, wherein coupling the second capacitor to the first electrode comprises delivering the first extra-systolic pulse at a first time and with a first amplitude, and coupling the fourth capacitor to the second electrode comprises delivering the second extra-systolic pulse at a second time and with a second amplitude.

22. A method according to claim 21, further comprising:

delivering cardiac resynchronization pacing pulses during a first period; and delivering extra-systolic pulses during a second period.

23. A method according to claim 21, wherein delivering extra-systolic pulses comprises delivering extra-systolic pulses following expiration of an extra-systolic interval after delivery of cardiac resynchronization pacing pulses.

24. A method according to claim 13, wherein the electrode is one electrode of an electrode pair and wherein said one electrode is adapted to couple to the heart in one of the following locations: an endocardial location, an epicardial location, a transvenous location, a subcutaneous location, a pericardial location, a location within a cardiac vein, a location within a coronary sinus.

25. An implantable medical device comprising:

first and second means for storing energy for delivery as a pacing pulses; and

means for coupling the first energy storage means to an electrode at a first time for delivery of a first pacing pulse to the heart, and for coupling the second energy storage means to the electrode at a second time for delivery of a second pacing pulse to the heart.

26. An implantable medical device according to claim 25, wherein the means for coupling the first and second energy storage means to the electrode comprises:

means for detecting intrinsic depolarizations of the heart; and

means for coupling one of the first and second energy storage means to the electrode to deliver an extra-systolic pulse following expiration of an extra-systolic interval after the detection.

27. An implantable medical device according to claim 25, wherein the means for coupling the first and second energy storage means to the electrode comprises means for coupling one of the first and second energy storage means to the electrode to deliver a pacing pulse upon expiration of an escape interval, and for coupling the other of the first and second energy storage means to the electrode to deliver an extra-systolic pulse following expiration of an extra-systolic interval after the delivery of the pacing pulse.

28. An implantable medical device according to claim 25, wherein the electrode is a first electrode, the implantable medical device further comprising a second electrode, and

wherein the means for coupling first and second storage means to the first electrode comprises means for switching between delivery of cardiac resynchronization therapy via the first and second electrodes and post extra-systolic pacing via at least one of the first and second electrodes.

29. An implantable medical device according to claim 25, wherein the electrode is a first electrode, the implantable medical device further comprising a second electrode, and

wherein the means for coupling first and second storage means to the first electrode comprises means for delivering cardiac resynchronization therapy via the first and second electrodes and post extra-systolic pacing via at least one of the first and second electrodes.

30. An implantable medical device according to claim 25, wherein the electrode is one electrode of an electrode pair and wherein said one electrode is adapted to couple to the heart in one of the following locations: an endocardial location, an epicardial location, a transvenous location, a location within a cardiac vein, a location within a coronary sinus.

31. A method comprising:

delivering pacing pulses to a heart of a patient via a first pacing output channel; and

delivering extra-systolic pulses to the heart via a second pacing output channel independent from the first pacing output channel.

32. A method according to claim 31, wherein the first pacing output channel includes a first capacitor to store energy for delivery as a pacing pulse, the second pacing output channel includes a second capacitor to store energy for delivery as an extra-systolic pulse, and delivering pacing pulses and extra-systolic pulses comprises selectively coupling the first and second capacitors to an electrode.

33. A method according to claim 31, wherein an amplitude of the extra-systolic pulses is less than an amplitude of the pacing pulses.

34. A method according to claim 31, wherein delivering pacing pulses comprises delivering cardiac resynchronization pacing pulses.

35. A method according to claim 31, wherein delivering cardiac resynchronization pacing pulses comprises delivering cardiac resynchronization pacing pulses to a first ventricle via the first pacing output channel, delivering extra-systolic pulses comprises delivering extra-systolic pulses to the first ventricle via the second pacing output channel, the method further comprising delivering cardiac resynchronization pacing pulses to a second ventricle via the second pacing output channel.

36. A computer readable medium for storing executable instructions for performing a method, said medium comprising:

instructions for coupling a first capacitor that stores energy to an electrode at a first time for delivery of a first pacing pulse to a heart; and

instructions for coupling a second capacitor that stores energy to the electrode at a second time for delivery of a second pacing pulse to the heart.

37. A medium according to claim 36, wherein the electrode is a first electrode, the method further comprising:

instructions for coupling the second capacitor to a second electrode for delivery of a first cardiac resynchronization therapy pacing pulse, and

wherein coupling the first capacitor to the first electrode comprises coupling the first capacitor to the first electrode for delivery of a second cardiac resynchronization therapy pacing pulse, and coupling the second capacitor to the first electrode comprises coupling the second capacitor to the first electrode for delivery of an extra-systolic pulse.

38. A medium according to claim 36, wherein the instructions for coupling the second capacitor to the first electrode comprises instructions for delivering the first extra-systolic pulse at a first time and with a first amplitude, and the instructions for coupling the fourth capacitor to the second electrode comprises instructions for delivering the second extra-systolic pulse at a second time and with a second amplitude.

39. A medium according to claim 38, further comprising:

instructions for delivering cardiac resynchronization pacing pulses during a first period; and

instructions for delivering extra-systolic pulses during a second period.

40. A medium according to claim 38, wherein the instructions for delivering extra-systolic pulses comprises instructions for delivering extra-systolic pulses following expiration of an extra-systolic interval after delivery of cardiac resynchronization pacing pulses.